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Towards an agenda of place, local agency-based and inclusive smart urbanism

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Introduction

The relationship between smart cities and urban space is currently dominated by glossy representations that share a visual narrative devoid of context and the messiness that accompanies contemporary urbanity. The smart city imagination display an odd ‘placelessness’ that bares little relation to the urban experience. In many ways it perpetuates the theoretically worn-out but still dominant dualism of cyber/smart urbanism as separate and alternative to the ongoing evolution of city spaces. The spectre of the smart urban fantasy represents a visual narrative that represents the ‘city in a box’ or the ‘mirror world’ – a version of the future as an ideal-state of connection, speed and gloss. These images hardly change in their travels across the globe, whether a reformulation of what Kigali in Rwanda should look like or a representation of future life in Hanoi, or Qatar. This decontextualized visual language represents the city in an orderly, ‘tidy’, idealised future: free of pollution, informality, unplanned neighbourhoods and crime. The implication is that the old can be replaced with the new; the messy present can be subsumed by digitally enabled nirvana. But, the chapter argues, the production of urban (smart) space is not just an add-on ‘solution’ and product of rational expertise and technical skill. It is above all the embodiment of specific visions of society, and of its economic development, which inform the shaping of spaces, facilities and services. The smart city appears then more as a re-mediation of existing trajectories, than any type of revolutionary stance

The tendency to engage in the techno-romance of idealised futures (Coyne 2001) is not an uncommon feature of city imaginings. Utopian visions have been part of urban history since the first conceptions of the city. City planning practice since the early 1900s is replete with idealised visions of the perfect city. In early digital city debates, techno-determinism is discernible in the many projections from the late 1990s that envisaged a frictionless urban environment where space no longer matters. Yet decades later it has become apparent (perhaps increasingly so) that both the inconveniences and opportunities stemming from spatial distance and proximity continue to be a factor in cities and that whilst much innovation exists, life continues as normal in cities across the world.

What informs the conceptualisation of this chapter is a tension between two perspectives through which the smart city concept can be looked at.. The first of these is that the notion of augmented urban space encourages us to look at how regeneration and its digitally enhanced aspects can end up being part of the same thread, informed by the same preconceptions, rather than the latter innovating and breaking away from the former. The second is the growing awareness of the on-going city making that happens outside the realm of traditional urban planning and design practices. The theme of ‘informality’ is relevant here and relates to the examples in this chapter. Rather than seeing it as an issue of the urban global South, a feature of disorder and illegality, contemporary thinking suggests a decentring of the concept, departing from the formal-informal dichotomy and recognising the ‘unofficial’ and ‘informal’ exists everywhere in the everyday (Marx and Kelling 2019). The examples referred to in this paper shows how technology plays an interchangeable role with livelihood strategies of those living in marginalised conditions in the global South, as informal urbanisation has become part of the everyday. We therefore argue, that learning from these experiences is not only relevant to the developing world, but resonates globally. From a place-based perspective, we explore the notion of interstices: place making practices that define less developed parts of cities outside the realm of traditional urban planning and design (Phelps and Silva 2017).

By considering these two qualities of contemporary urban change we explore an alternative conceptualisation of the smart city that engages the present and the everyday, that emphasises the importance of place and argues that innovation is iterative and often to be found in unexpected places. The future is continuously being made and remade,

by its very nature a conversation between technological appropriation and local innovation. Rather than seeing the ‘new’ (digital) as replacing the ‘old’ (analogic) in a linear temporality, we see the interaction between the two as reciprocal and dynamic. Our aim is to argue for a situated reading of the high technology-augmented city that recognises the importance of the often more informal but crucial urban interstices that give us clues into the markers of contemporary urbanity. We argue for an approach that embraces current literature on the urban everyday through a relational lens as constituting a research agenda that embraces the continuous remediation of multiple, existing future trajectories.

Redesigned urban futures and missed opportunities

Recent urban debates have highlighted the problematic relationship between the smart city imagination and entrepreneurialism (Datta 2015; Das 2015), whilst earlier ‘digital city’ explorations sought to understand the relationship between city governance and smart technologies (Aurigi 2005; Odendaal 2003). The question is whether the smart city is a game-changer when it comes to conceiving and delivering innovative approaches to urban development and regeneration, as it is currently being portrayed by industry hype.

When Robert Hollands wrote his 2008 seminal paper titled ‘Will the Real Smart City Please Stand Up?’ he mainly referred to the concept of the smart or intelligent city as the leveraging on improvements in civic ICT infrastructures for either place marketing, or towards supporting gentrified forms of economic development. Such model of an entrepreneurial city falls foul of environmental and social sustainability, and citizens’ participation, yet many smart discourses claim to address and solve these very problems. Smart rhetoric tends to frame those problems as the product of “a ‘sick city’ permeated by a series of pathologies” (Söderström et al 2014, 316) mainly because of inefficiencies in its current systems. Prevalent smart city propositions therefore stem from an “intense anti-urbanism” (Dear 1995, 31) that is a typical generator of utopian planning (Choay 1997, referred to in Söderström et al 2014, 316), but they do this without exploring any new ideas and models of inhabitation and social equality. As Söderström et al (2014) argue in their revealing analysis of IBM’s Smarter Cities’ discourse: “‘smarter cities’ is a mild utopianism: it promises efficiency rather than paradise on earth” (p.316). In other words, the ‘smart’ paradigm is following logics of

optimisation of current place-making practices, and the improvement of specific lifestyles and desirable models of development that underpin these, rather than posit any alternative futures.

Placemaking for the Middle Class

Such an approach has very significant spatial and social connotations, and supports specific agendas rather than being limited to adding some, allegedly neutral, functional virtual layer to cities. Globally, this is uncannily ubiquitous, but as Watson (2013) argues, in the African context, it is closely tied to real estate multinational firms' investment strategies in what has become known as the 'last frontier' for property investment. Representing a 'fantasy urbanism' of sorts that seemingly seeks to overcome the messy urban realities of informality and urban poverty, the impact of the implementation of these plans is profound. Land speculation can lead to dispossession and relocation, especially in regeneration processes. The digital fantasy can easily translate into an analogic nightmare for some as market exclusion sees well-located locations become available to the digital (and other) elites only. As shown in Datta and Das's ongoing work on the smart city programme in India, there are important questions to be asked regarding citizenship and exclusion (Datta 2015; 2017; Willis 2019). Not only do smart city interventions have little contextual relevance but they also have impacts on livelihoods in inequitable conditions. The largely infrastructure-led approach to the implementation of smart city programmes runs the risk of perpetuating inequality, at worst, but misses an opportunity to use technology to enhance livelihoods, at best. The relationship to informality, hence a significant aspect of 'context', for example, is largely unexplored, yet the footloose nature of technology enables an intimate relationship between livelihoods and smart appropriation (Odendaal 2014). Thus, the relationship between smart city and responsive place making has transformative potential, yet has recently become a code for particularly reductive trends of area-based regeneration and master planning.

Area-based approaches carry potential for equitable regeneration by approaching urban development and re-development from a holistic viewpoint, inclusive of the need of the whole population living in a place (Urban Settlements Working Group 2019). Conversely, contemporary smart city design narrative reinforces a very narrow imagination with regards to lifestyles and livelihoods. Perhaps its most glaring

exclusionary focus is in urban regeneration aimed at shaping cities for a very specific social class. The tension between utilising the creative city discourse as a ‘worlding device’ and place-based responses, is well captured by Nkula-Wenz as she explores Cape Town’s ongoing flirtation with entrepreneurial governance and its exclusionary logics (2018). The new citizen imagined as part of smart city narratives appears to be a version of that described in Alvin Toffler in *The Third Wave* (1981): someone mainly involved in the service economy, who could produce and work just from about anywhere. This person was therefore highly mobile and unbound to any specific place, whether by choice or not.. Discourses surrounding creative cities (Landry 2012), that underpin liveability indices such as the AIA Principles for Liveable Communities (<https://www.aia.org/>) share these characteristics with recent conceptions of the smart city: an utopian spatial imagination that assumes blanket upward social mobility. And the socially mobile and exigent middle classes express themselves through consumption – be it the purchase of goods, of experience, the fruition of culture and entertainment. When urban living and citizenry are framed in this way, it is natural for urban space to become a commodity.

Regeneration- missed opportunities

Given such constructed needs of the hegemonic middle class as the ideal group of city dwellers, an area-based approach to regeneration driven by those needs enables urban and suburban areas – often in potentially prime and attractive locations – to be isolated and safely designated for renewal and investment. As ubiquitous in the South as they are in the North, often labelled in the US and UK as Business Improvement Districts (BIDs), in South Africa City Improvement Districts (CIDs) they are based on introducing private control of entire urban precincts and their ‘public’ spaces:

“When it comes to the BIDs pyramid, which is geared towards creating the optimum trading environment, the first layer on which the whole structure depends is the creation of a clean and safe environment, so just as man needs to breathe and eat to survive, these parts of the city need to be clean and safe. The next layer is ‘transport and access’, the level up is ‘marketing and branding of the area’ and the apex is the creation of a ‘memorable experience for visitors’” (Minton 2009, 43)

The emphasis on ‘visitors’ of the BID, rather than on citizens, is very revealing. On the

one hand the emergence of these large chunks of urban territory has raised issues of the lack of authenticity of "...an architecture of deception which (...) is almost purely semiotic, playing the game of grafted signification, theme-park building" (Sorkin 1992, 4). But perhaps more importantly, this implies a significant shift and narrowing of the focus on what the city is expected to be for. It reveals an obsession for specific, clean, acceptable and dignified activities which are associated with gentrification, "jettisoning a physical view of the whole, sacrificing the idea of the city as the site of community and human connection" (Sorkin 1992, xiii). The problem with gentrification, however, is that it involves the collateral damage of removing/shifting and ignoring those parts of society unable to gentrify. Where regeneration projects talk of 'reclaiming' public space, this is of limited benefit to those who can afford it and results in a 'cleaning out' those that cannot (Minton 2009, 52). The outcome is that urban poverty is simply displaced, rather than 'solved' through regeneration (Madden 2013). When smart urbanism visions are similarly skewed, the danger is that they could further amplify those social divides, by boosting the potential of exclusive areas and the lifestyles of already empowered individuals.

Smart gentrification as part of a global imagination

These exclusionary dynamics becomes particularly poignant in urban spaces of the global South, where middle class enclaves contrast with extreme urban poverty. "Ordinary cities" such as Johannesburg and Nairobi may appear to fall outside the world city dynamic, but are sites of functional networks that connect across geographic boundaries (Robinson 2006). Departing from a hierarchical world city classification enables an analysis that recognises that global economic connections are diverse and complex, where "...the city is increasingly a key articulator in a new, regional geography of centrality, dispersal, mobility and connectivity that expands not only to the rest of the continent but around the globe." (Mbembe and Nuttall 2004: 360). Their 'apparent structural irrelevance' (Robinson 2006: 99) deems them less connected to the world economic hierarchy of global finance and economic transfers. Cities such as Johannesburg (discussed in Robinson's work) and Lagos (see Gandy 2005) are traditionally seen as marginal to the networks of economic flows that underpin the global economy, yet are intimately connected into global networks through the everyday.

State efforts to attract Foreign Direct Investment (FDI) through place marketing and event attraction (the hosting of the FIFA World Cup in 2010 in South Africa for example) are integral to policy objectives that seek global visibility. Increasingly the smart city narrative is used as marketing language for new satellite cities and redevelopment areas. These skew infrastructural investment to the exclusion of city spaces that are in dire need of intervention, and/or lead to resettlement of residents. This also mirrors in the plans for erecting many new ‘smart’ towns in Asia or the Middle East, where the pretext of the advantage of building a new techno-utopia from scratch fits very well such highly selective regeneration approaches. The case of Songdo is perhaps one of the first to be examined in detail, with planning efforts to enable liveability and connectivity largely failing (Townsend 2013) and African versions, such as Eko Atlantic having very little to do with the rest of Lagos (Ajibade 2017). The contrast between these ‘premium networked spaces’ (Graham and Marvin 2001) and the emergent and informal urban spaces in many cities of the global South is particularly pronounced and makes this dynamic particularly insidious.

However, dynamics of systematic spatial exclusion and economic marginalization are not unique to the South. The term ‘emergification’, initially coined by Financial Times reporter Joseph Cotterill (2010) in the context of investing in emerging economies, can also be very effective to highlight the limits – and demise, to an extent – of the ‘we are all middle class now’ (Jones 2012, 140) tenet of the city and the smart city itself. There is evidence of various ‘first World’ economies and societies ‘emergifying’, as citizens are forced by adverse economic conditions, loss of jobs or considerable reduction of income, to make ends meet through considering and adopting less consumption-based and wasteful, lifestyles, and go back to valuing social capital basics such as local collaboration, communes and more informal markets. A major 2012 survey of Italians – despite their country still being included in the club of the main economic global powers – revealed the “collective perception that reality is changing in an irreversible way, and one which is strongly pejorative” (Masci, 2012, translation by the author). Cloza (2012) also uses the term ‘emergification’ when talking about the Italian ever-growing informal economy, exactly to describe how “We are becoming, or maybe going back to, being like emerging countries”. Similarly, Hadjimatheou (2012) describes how small-scale farming can become a desirable alternative for former city dwellers in Greece. In the meantime, economic commentators are warning that the

failing to adjust even larger sections of the population of Western countries is generating an ever-increasing rise in household and personal unsecured debt, representing another economic crisis ‘time bomb’ (Inman and Barr 2017).

The fact that entire sections of society and cities face or will face the task of re-inventing their economies is certainly not new. What is noticeable is a growing awareness that this cannot and will not be done simply through a process of turning everybody into white collar workers operating in the service industries through large corporations. An increased emphasis needs to be put, especially in those many towns – the vast majority of the World, in fact – that do not enjoy any privileged position in global trade and financial networks, on the facilitation of bottom-up, social enterprise. It becomes crucial to enable communities to leverage local resources and re-establish local markets, promoting cheap, collective mobility means, and fostering all sorts of lateral ideas such as, just to name one, urban farming. It seems necessary, in other words, to re-empower the growing number of people who have been let down by the mirage of consumption-fuelled wealth-for-all and indeed the consequent vision of a service and leisure-only city where everybody makes a living ‘opening doors for each other’ (Jones 2012, 54).

Yet, the smart city visual and marketing narrative is closely tied to an imagination of the smart citizen that bears very little resemblance to the livelihood struggles of the everyday (Datta 2015). This therefore leads to a homogenisation of citizens according to pre-constructed lifestyle images; where these lifestyles are increasingly hinged on the availability of disposable income and leisure time. Meanwhile, those lacking such lifestyles can become increasingly invisible and negligible. As noted before, a tourist-like profile seems to be the new expected normal for city users. Many urban regeneration initiatives therefore verge towards making the profile of the ‘citizen’ and that of the ‘tourist’ converge, as argued by Elizabeth Wilson: “Not only is the tourist becoming perhaps the most important kind of inhabitant, but we all become tourists in our own cities...” (Wilson 1995, 157).

The reassuring and business-friendly features of a service-rich, clean and safe environment, with good transport links and offering a ‘memorable experience’ to citizens who very much become visitors, are in fact largely remediated by smart city technology offerings, and celebrated by the related commercial literature. The prevalent,

mainstream visions of smart urbanism involve an urgency to address the needs for cleaner and environmentally more sustainable towns, though with a marked focus on high-middle class expectations. Hitachi's Smart Cities website for instance warns about "the growth of slums, air pollution, the difficulty of acquiring fresh drinking water, the treatment of waste water and sewage, energy supplies, traffic congestion, and waste disposal" (Hitachi.com website, last accessed Nov 2013). It however presents a series of scenarios about 'Living in a Smart City' which range from 'Freedom to Work When and Where you Want' to 'Convenient Vehicle Use as Part of the Community' and 'Well-balanced Lifestyles in Tune with How People Live'. In one of these for instance a hypothetical housewife states: "Because we live in the suburbs, my husband normally commutes to work by car. He drives an electric vehicle (EV) that fully recharges while we sleep (...) He saves time in the morning by checking his schedule while he is in the car" (Hitachi.com website, last accessed Nov 2013). This short description makes some revealing assumptions, as it describes an ideal smart city dwelling situation as one of urban sprawl, possibly functional with forms of gentrified and exclusive out-of-town living. Being in the 'suburbs' seems in fact to be associated with an absence or deficiency of public transport, and a dependency on the motor car. The 'husband' going to work seems to have a highly variable schedule which needs to be checked in the morning and requires high levels of continuous connectivity, suggesting some form of executive employment.

Similar interpretations come from GSMA, the worldwide trade association of mobile telecommunication operators. Its 'Connected City' initiative and exhibition claims to address "making homes and cars smarter, travel swifter, shopping easier and urban living safer and more environmentally friendly" (GSMA website, last accessed Nov 2013). GSMA also keeps a 'Smart City Index' categorization and ranking, which interestingly is based on indicators named 'Smart Mobile Services', 'Business, Economic and Mobile Cluster Impact', 'Smart Mobile Citizens' and 'Mobile Infrastructure' (GSMA Smart City Index, last accessed Nov 2013). Another notable example is the impressive Living PlanIT documentation on what has been defined as the blueprint for an 'Urban Operating System' (UOS). This also makes explicit reference to, and places great emphasis on, the importance for cities to foster knowledge economies, and how smart urbanism can be central to it, arguing for "strategies to increase the sophistication of their populations to service and attract advanced

industries” (Living PlanIT 2011, 4).

So, the smart city – or at least an interpretation of it which is being promoted by the tech. industry and often embraced as an out-of-the-box solution by municipalities and governments – shares and remediates the aims of gentrification-keen urbanism, and indeed provides new ways to project a certain vision of city ‘users’ further. In these visions, the ‘smart citizen’ uses the city in a way that implies high levels of mobility, and the need for ubiquitous services to support such mobile and knowledge-based occupations. It is of course necessary for the smart citizen to be conversant with high and mobile technology, be able to afford hi-tech gadgetry, and be willing to interact with advanced systems of data feeding and reporting. This also implies that such citizens are themselves highly mobile and potentially disloyal – they can move somewhere else easily – hence behave as the paying customers of the city, and that the latter is driven to provide them with the control, services, safety and cleanliness they expect. Most proposed projects therefore do not question any of the typical high-middle class models of living. For instance, the motor car and its presence in the city is never particularly put in doubt or challenged, but is remediated by technologies that offer enhanced ways to use it and find parking spaces (see for instance Lamba 2013), hence making it appear more, rather than less, socially and environmentally acceptable.

These two overlapping aspects of creating territorial exclusion, or exclusive enclaves of regeneration, and constructing the ‘smart’ citizen as a high-middle class dweller and user of services and infrastructure-rich areas offering specific lifestyle advantages, add up to make emergent smart city models.

For instance, the Konza ‘technopolis’ outside Nairobi, Kenya, is described as Africa’s ‘first smart city’ and promises a connected future for its citizens. Estimated to cost \$14bn in infrastructure investment, this ‘silicon savannah’ (Anderson 2017) is aimed at building on the country’s growing ICT sector but creating a hub for entrepreneurs. Yet many of these hubs exist, in the city of Nairobi, albeit in less glamorous surroundings, with some arguing that a critical mass does not yet exist for justifying a decentralised location for the sector (*Ibid.*) The future population is projected at 250 000 with the marketing language replete with descriptions of service delivery, improved municipal infrastructure and enhancements, and real-time monitoring systems (Burger, 2017).

Whilst portrayed as technological support to enhance the lives of people, not only does

Konza bear little relation to Kenyan urbanism but is also located 37 miles from Nairobi. Despite claims of future sustainability, very little evidence suggests that the spatial concept deviates from a modernist, car-centred, mono-centric zoned living environment the literature argues against. But this is not a tension limited to new developments in the global South. The highly-debated case of the Quayside project by Google's Sidewalks Labs in Toronto reveals similar pitfalls, in contrast with promises of sustainable development and affordability. Canada's Prime Minister has described the hi-tech waterfront neighbourhood as "a step toward 'smarter, greener, more inclusive cities', and 'creating a new type of neighbourhood that puts people first'" (Murphy 2017). But the nature itself of the scheme seems to be encouraging a strong selection when it comes to prospective residents, resulting in a homogenous, high-middle class neighbourhood. Austen (2017) has noted how "Quayside's current plans promise housing for people of all income levels. But the only company so far committed to moving there is Google Canada, suggesting an influx of young, affluent workers".

Missing the revolution?

There seems to be a convergence between social and spatial gentrification and the tenets and consequences – intended or not – of the production of digitally-augmented cities. Hollands (2008) outlined how wide and complex the range of interpretations of the 'smart city' concept was. But he also remarked how its aims ended up being very much aligned with the type of gentrified urban economic development this chapter is reflecting on. Instead of representing a change of direction, an innovative view and approach, it can very much mirror and reinforce the trend. In a way this does not have to be particularly surprising. Although the frequent – and often marketing-based – hype about the role of high technologies in the city tends to present these as a game-changing, revolutionary factor, the point of view of Bolter and Grusin (1999, 182) arguing that cyberspace is a 'remediating' force which extends earlier media and spaces, is an enlightening and particularly relevant one here.

Remediation is providing an explanation on how what is being portrayed as a potential technological revolution does not seem to be underpinned by any particular revolutionary idea pointing at a progressive model, either in socio-economic

organisation or indeed civic design. So, Hollands' observations fundamentally still stand, despite an apparently ever-evolving and increasingly technologically sophisticated landscape. The smart city therefore can end up being a simple, digitally enhanced way of re-packaging recent forms of commercial urbanism.

This is where the utopia of industry-driven smart city visions shows its limitations. Townsend still compares past models with present developments when he argues that Ebenezer Howard's Garden City "was the Songdo of its day - network technology undergirded its daring break from the past. While Londoners choked on smoke from a million coal-fired furnaces, Howard's utopia would run on clean municipal electricity" (Townsend 2013, 95). This is understandable with a lens of 'break from the past through technology', but – beyond any wider considerations on its actual impacts on city design – it has to be acknowledged that Howard's vision embedded a social reform agenda and a brand new model to propose. It was at least based on a revolution of the concept of land ownership based on an urban 'commonwealth'. Major smart city developments like the often-cited Songdo or Masdar, however present no major, critical alternative view of the principles of living, working and socialising – and governing all this – in geographically contiguous settlements.

The question at this point can be: how can this be steered – or maybe hacked - in more transformative, adaptive, socially sustainable and place-aware trajectories? There are two related tensions that surface with regards to the relationship between the fantasy smart city, which can manifest in area-based, redevelopment efforts but nevertheless embraces their principles, and the somehow neglected 'analogic' city through which people move and pursue their lives. The one relates to the contrast between the pre-designed and programmed spaces of consumption and prioritisation of the knowledge-based economy and the incremental and messy continuous unfolding of the 'real' city. The second refers to city as an imagined future of order, seamlessness and low friction mobility that contrast the contingency and emergence of present urbanity. In the following section we explore the notion of 'interstices' as a means to address this divide, engaging and leveraging on the authenticity and diversity that urban contexts provide.

Getting dirty and real with the ‘smart city’

Short of some form of urban revolution based on radical, major changes, a way to start making smart city efforts more relevant to the realities of urban existence mentioned so far is to move away from the spatially and functionally selective and prejudiced models of a ‘pure’, safe and efficient smart urban machine. This means shifting our gaze from the investment and discourse-dominating mainstream smart urban ‘solutions’ and engaging with the ‘grit’ of everyday diversity and tensions, which can reveal local wisdom and resources.

Leaving out the parts of urban space which are not functional to a certain regeneration trajectory by focusing interest and visibility towards those that do is close to what Ingold calls an urbanism of ‘assembly’:

“This distinction between the walk and the assembly is the key to my argument (...) Once the trace of a continuous gesture, the line has been fragmented – under the sway of modernity – into a succession of points or dots. This fragmentation, as I shall explain, has taken place in the related fields of travel, where wayfaring is replaced by destination-oriented transport, mapping, where the drawn sketch is replaced by the route-plan, and textuality, where storytelling is replaced by the pre-composed plot. It has also transformed our understanding of place: once a knot tied from multiple and interlaced strands of movement and growth, it now figures as a node in a static network of connectors. To an ever-increasing extent, people in modern metropolitan societies find themselves in environments built as assemblies of connected elements” (Ingold 2011, 75).

This can be increasingly facilitated by smart city technologies, as they allow and encourage – under logics of efficiency and rationalisation of movement – point-to-point interest. The efficiency of digitally enhanced navigation – and even more so the push towards autonomous vehicles – replaces the serendipitous, inefficient appreciation of interstices and the not necessarily negative chance of getting lost and discovering something or someone, as argued by Shapiro (1995) at the dawn of cyberspace-related debates, and more recently by Foth (2016). There is a desired ‘seamlessness’ that aims to reduce friction of movement and decision-making into a designed optimised ‘whole’.

This approach aligns with the ways the creation of Business Improvement Districts

(BIDs) is concerned with maximising the potential of urban space as a commercial environment. Spatially, but also digitally, this is fundamentally achieved in two ways: by providing a series of arrival points – shops, cafes, attractions and services, for instance – and efficiently directing people to them, regulating and selecting access. It also involves sanitising and commodifying as much as possible the route itself to these points of consumption, so that it anticipates, prepares and leads to them, as well as embedding some. Street furniture interventions in such places show an obsession with signage and the management of the visitor's experience to keep them on the right route, and this is often seen as the most obvious priority in regenerating an area to boost its commercial potential. The smart layer promises a frictionless experience whereby the smart citizen is continuously connected and served by the sentient presence of the screens apps and urban services that constitute the Internet of Things (IoT).

As for excluding certain categories of people, there can therefore be an effort to design out certain forms of urban space which are seen as undesirable and incoherent with the dominating view which “has become fragmented into individualized pieces incompatible with the creation of a physical plan”, and as a consequence “we have no map of the city linking together the poorer neighbourhoods with the enclaves of the well-to-do. A plan or a map might draw us closer together and underscore our collective plight” (Boyer 1993, 112-113)

All of this can therefore hide and undermine the value and role of those parts of the city that are not functional to the view of it as a series of easy to access, safe and sanitised commodified destinations. These have been called the ‘interstitial’ spaces in the city, which “represent what is left of resistance in big cities – resistance to normativity and regulation, to homogenisation and appropriation” (Nicolas-le Strat 2007, 314) – both in spatial and social terms. These spaces of resistance are not necessarily confined to event-driven social action (such as occupations or protests), and they are very much part of many people's ‘everyday’. In the global South, these ‘interstices’ are what can define many urban spaces and extend to the use of technology. The informal urbanization that typifies urban growth in cities in Africa relate to how people house themselves and pursue their livelihoods.

The embedded need to control movement in accordance with an idealised blueprint is in itself a Modernist planning legacy. The temptation to apply standardised formulas of

technological-fix and rationalisation to the city is particularly relevant to contemporary smart interpretations. Fragments and interstices are messy interlopers with no place in designed smart futures. In the 1990s Rem Koolhaas spoke of the ‘city’s defiant persistence and apparent vigour’ as representative of the ongoing agency of ordinary citizens who continuously make and remake their cities, ‘disconcerting and (for architects) humiliating’ (Koolhaas 1995; Tonkiss 2012). In architecture and urbanism, the adoption of an ‘international’ style based on modernist rationalism has affected – and is still affecting – the shape of developments in many Asian and Middle-Eastern centres, the quality of those places and indeed their ability (or inability) to leverage local historical wisdom and be sustainable. Similarly, the ‘smart’ city is generally being proposed as an extension and upgrade of that very modernist concept of the city, where the rational ‘machine’ is made yet more efficient through the deployment of digital service and control, based on the centralised digestion and elaboration of ‘big data’. As steel and glass skyscrapers might not necessarily have been the most environmentally sustainable choice for sub-tropical developing towns, the smart urban machine with its often standardised, pret-a-porter solutions is unlikely to generate a universally socially sustainable urban growth trajectory.

This urgency is multi-dimensional. If on the one hand it is easier to conceive that as many ‘everydays’ exist as the different geo-social contexts generating them, on the other hand it is also important to notice how diversity is key within the same location. Growing social polarisation and the need for alternative socio-economic approaches are widening the gaps between a range of diverse contexts within the domains of countries, regions and cities, which smart city initiatives cannot treat as homogeneous.

How do we look at interstices in the smart city? We would argue this needs two main – and obviously overlapping – foci. First, letting the interstices highlight issues and provide place-based wisdom, rather than simply raw data for some algorithm. Second, using ubiquitous computing for enabling local agency.

Drawing from place and its socially embedded wisdom

Imprinting a material layer on the interactions of the everyday, especially with regards to new technologies, surfaces qualities of socio-technical interaction that deviate substantially from the mainstream imaginations of the smart city. As urban dwellers

appropriate technology as an ongoing input into livelihoods, the manifestations of these moments take on spatial forms that are contextually embedded and intimately related to place. One relates to the spatial modalities of ICT use in many cities of the global South for example, where container telecentres, informal phone shops on side walks and the sale of airtime by street vendors at road intersections reveals a more flexible and ‘real-time’ transformation of urban space. Innovations are mediated by culture and social norms. A second dimension relates to local innovations that have spatial implications such as the use of MPesa, a Kenyan mobile money transfer innovation, that enables remittances between cities and remote urban areas (a core part of livelihood strategies of urban migrants) (Gikunda, Odilla and Njeru 2014).

For infrastructural projects in developing countries, the economist Tim Harford has noted that “although the technical properties of the system may have been understood and improved, the human properties of the system have not been addressed at all” (Harford 2006, 227). The process of shaping the smart city needs therefore to bring people back into the equation not simply as ‘users’ or controlled consumers of urban system and space, but as active contributors to it, and creators of markets. Local appropriation of technology by low-income communities can facilitate sustaining and enhancing informal but vital economic systems and markets in cities, with positive effects for those communities (Odendaal 2006). The relationship between space and informality is important, since “understanding the spatial manifestations of marginal livelihoods is important. They provide us with clues on the entry points for technology appropriation in urban space” (Odendaal 2013, 33). Communities can do much, and can be extremely creative and ‘lateral’ at how technology-enabled networks are formed and utilised. The ability of the smart city to provide support and facilitation for such bottom-up approaches and ideas can be key in ensuring that those ideas – and the communities able to generate them – succeed.

This therefore involves accepting that digitally augmented urban space cannot be treated as a homogenous territory, or indeed a corporate commodity. The progressive smart city relies on the power and relevance of context. Ignoring local values, culture, knowledge and indeed space can result into making the machine-space rigid, blunt and insensitive; as argued by Sassen: “What stands out is the extent to which these technologies have not been sufficiently ‘urbanised’. That is, they have not been made to work within a particular context” (Sassen 2011).

Envisaging, fostering and supporting local solutions, the type of approaches which this chapter has argued are needed for cities and communities in a post-bubble era (and for the next bubble burst), inevitably requires leveraging on local resource, culture and wisdom, and indeed on the value of the characteristics of place themselves: “Context would not just be an opportunity, but it would become one of the central generators of the digital intervention” (Aurigi 2013, 138). As traditional and vernacular architecture, often ignored by modernist development, can hold the key to a deeper understanding of place and ideas for a truly sustainable use of resources and inhabitation (for a review of this see Vellinga, 2013), the city of smart space and objects will greatly benefit from keeping in touch with the richness and wisdom embedded in place.

Enhancing local agency in smart cities

The ubiquitous computing characterising smart urbanism visions means the fixtures and utilities of contemporary life, the everyday functions and infrastructural uses, are, “...augmented with computational capacities...” (Dourish and Bell 2007: 414). The boundaries between private and public have become less certain. As technologies become increasingly mobile and pervasive, opportunities for surveillance increase, as do a ‘real time’ interface between everyday decision making and technology use. As we purchase goods at supermarkets (using credit cards), stop at traffic intersections (through traffic web cams), acquire books and music online and enter buildings (through electronic entry points) we leave ‘bits’ of ourselves; “These technologies allow spaces to both remember and anticipate our lives” (Crang and Graham 2007: 789) and they becoming particularly poignant to those who live their urban lives ‘on the move’ (Simone 2004) in precarious circumstances.

This has implications for the experience of space and movement between places. Ubiquitous computing anticipates a spatial dimension where the digital and physical co-produce an experiential dimension typified by seamless flows of information and interaction. A hybrid space is possible at the interface between infrastructure and human experience (Dourish and Bell 2007) that does not distinguish between the material and human but recognises the relational qualities of this socio-technical exchange. Whilst traditional networked infrastructures are tangible and fixed, ubiquitous computing is pervasive, mobile and increasingly footloose due to wireless capacity. This means that it can be employed to shape and characterize different, localized versions of hybrid space,

instead of simply offering a sanitized and homogenous experience. What emerges is a ‘dance’ between the digital and the physical, the social and the technical, in the ongoing production of space and creation of place, where code itself – far from being seen as neutral – purposefully embeds specific values, interpretations, and expectations related to local culture and agency. Merging the past, present and future as part of a sociotechnical continuum provides a platform for contextually appropriate city making. In the following section we explore what conceptual parameters for such an approach could be considered by smart city-makers.

The case for a more inclusive research agenda for smart cities

The making of cities is the ongoing interacting agency of designers, planners and citizens together with the many other stakeholders that contribute to their shaping and management. Inclusive cities stem from primarily considering communities or citizens and how their needs are accommodated, rather than a mechanistic logic, based on geometries, functional macro-zoning or abstract guidelines. The type of smart city represented by the highly codified representations of IT company-driven urbanism shares many characteristics with the civic models driven in the past and it is no small coincidence that many plans share codifications with New Urbanism. Contemporary thinking on the making of place advocates a more fluid and emergent engagement with context, whilst work on cities of the global South acknowledges qualities of emergence, contingency and informality.

The normative urgency in cities across the globe is a transition towards more sustainable and inclusive cities (see New Urban Agenda adopted at Habitat III in 2016). Many aspects of smart monitoring and control seem to align with this. In lower income environments however this entails allowing space for low technology innovation; labour intensive implementation, and decentralized management of services. Pieterse for instance argues for an approach in the global South that pursues optimal resource efficiency, ensures universal service coverage while articulating with economic multipliers (2014). Technically this requires analysis of materials flows that not only links back to industrial ecology and urban political economy (administrative regimes and governance) (UNEP, 2013) but also crucially to livelihoods strategies.

Despite cities experiencing a growing pressure on, and unevenness of infrastructure,

urban life continues to be reinvented at the margins. Social networks function as critical livelihood arteries in the ongoing survival strategies of the poor. These transactions cannot be defined in space or frozen in time. This terrain comprises a divergent range of intentions, communications and movements exchanged between multiplicities of actors making sense of their life worlds, and is often articulated in the informal economy, in makeshift housing and fleeting urban encounters. The potential exists for harnessing these strategies, building on the social capital created despite the absence of, or in addition to, the usual resources available for survival. Despite their lack of guaranteed permanence, these social networks provide the vehicles for information sharing, resource negotiations and support in precarious living conditions. They are also closely tied to context.

Developing a smart city that enables economic production demands an engagement with the human and cultural relationships, and the local human and natural resource strengths that define trade and exchange of goods and services. Simplistically assuming the predominance of the tertiary economy falls foul of engaging the realities of city spaces worldwide. In the way they tend to be portrayed by mainstream smart discourses, ‘smart citizens’, actually comprise a very small proportion of inhabitants in cities of the North and South. In many cases livelihoods entail mobility: between cities, between the rural and urban, and often across borders (Simone 2010). These circuits rarely coincide with the more formal spatial delineations of regeneration. The implications are twofold. The potential of existing services and technologies is not maximized in terms of how much it could facilitate employment and economic growth, and secondly, it may constrain a wider perspective on mobility and livelihoods. “This is more than simply building new roads, rails, power lines, and telecommunications. It is more of a matter of constructing synergies between the physical, the institutional, the economic, and the informational.” (Simone 2010: 29). What emerges is a need to gain insight into how networks are constructed and maintained and how that ties in with how technology is used. This calls for an approach that goes beyond a simple infrastructure viewpoint and more towards a networking one, and emphasizes facilitation over simple provision of services or products. The articulations between circuits of exchange and technology access need to be enabled and understood in how they contribute to the making of place.

Thus, there is a need to consider cities as socio-technical systems that incorporate human ingenuity, reinvention at the margins and, more than anything, to recognize that

urban change is iterative and experimental. Spaces for learning and creativity need to be enabled, and research efforts to uncover these and understand how they work and what city-makers can learn from them need to be a key enabler. Such micro-level socio-technical environments encompass small networks of actors that add new technologies to the agenda, promoting innovations and novel technological developments. This may reveal configurations of actors hitherto unexplored in studies of smart cities. How social learning from niches can be applied at the city scale to help reshape the existing infrastructure regime is a challenge that requires a multi-scalar perspective that is mindful of the connections necessary for survival (UNEP, 2013: 14). The aim is to not only uncover the actors, institutions, technologies that affect beneficial change, but the relations between them. It is through such constellations that agency emerges.

Conclusions

We argue for a smart city-making approach and a research and development agenda that untangles these relations in urban space. It requires ‘thick description’ of the everyday that leads to uncovering, “...emergent groups, multiple lay-expert knowledge forms, programmes of action, valuation regimes, fluid topologies.” (Fariás, 2011: 367). The emphasis on the empirical also enables deep contextual inquiry. Case studies that document the interstitial manifestations of the interface between digital and analog, as an ongoing unfolding of the urban everyday, enables inquiry into how contingent the smart city is. That in itself is political: regime change is about continuous questioning (*ibid.*). Furthermore, as an “...empirical tracing of how it is that materials come to matter...” (McFarlane 2011: 734) Technology innovation can be tracked from above and below. The learning that informs and emanates from the appropriation of technological artefacts could then be used more broadly, leading to a conceptualization of the smart city as a living, breathing phenomenon, continuously being reinvented. It requires an engagement with social and spatial agency at the local scale. A conceptual frame that reveals hopeful engagement with the ‘everyday’ encounters between people and technology offers opportunities for emancipation; “...an engaged political project that asks evaluative questions about how urban technologies are socially appropriated, why and in whose favour?” (Coutard and Guy, 2007: 731).

This chapter commenced with an account of the ways through which the smart city narrative overlaps with utopian ambitions often associated with exclusionary

regeneration strategies. Smart infrastructure may be part of the problem as we continue to associate it with glossy futures that have nothing to do with the everyday city. Thus, a regime change is required, that goes beyond mechanistic visions of efficient design and place making, to understanding the emergent properties of street urbanism and how the poor get by. Much of this day-to-day invention speaks to the interface between the material and human. The availability of technology is generative - it leads to outcomes that are assimilated back into livelihoods - and how appropriation interfaces with livelihoods is part of the conversation that needs to be shared.

Rethinking the conceptual lens, that frames ideas surrounding smart cities, presents an opportunity for researching and understanding urban space from an agency perspective. This requires empirical openness, rethinking scale by zooming in on the hyperlocal, informal and non-prime dimension of place, what we have called the 'interstices', as well as setting aside usual assumptions regarding the relations between technology, the state and the economy. In this chapter we have sought to make the case that this is good for urban theory, and could be excellent for city making.

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